

**MERCHANT MARINE ACADEMY OF MACEDONIA
SCHOOL OF ENGINEERS**

Course: Maritime English VI
Academic year: 2025 – 2026
Student's name:
Student's number:

Semester: Sixth
Exam period: February
Date: 05/02/2026

Instructors: A. Birbili, M. Tsompanoglou

Exam paper grade:

FINAL EXAM

1. Fill in the gaps with the appropriate measuring and testing equipment used in the troubleshooting process. (12 p.)

compression tester	multimeter	surface roughness tester	ultrasonic thickness gauge	cylinder liner gauge	dial indicator
diagnostic software programs	vibration analyser	fuel pressure gauge	visual inspection tools	bore scope	smoke meter

- A(n) _____ can help engineers discover excessive roughness of the cylinder liner's surface, indicating wear or corrosion.
- A(n) _____ uses high frequency sound waves to measure the depth of cylinder liner walls non-destructively.
- Small deviations or irregularities in the cylinder liner surface can be detected with a(n) _____.
- A(n) _____ can detect fuel pump malfunctions, fuel filter clogs, or fuel line leaks.
- Engineers use a(n) _____ to measure the inner diameter of the cylinder liner at multiple points along its length.
- The _____ is an essential tool for visually inspecting the interior surface of the cylinder liner.
- Worn piston rings, cylinder head gasket leaks, or valve problems can be identified with a(n) _____.
- _____, such as mirrors, flashlights and magnifying glasses, can be used to inspect the exterior surface of the cylinder liner.
- A(n) _____ can help to identify misalignment, imbalance or worn engine components.
- A(n) _____ measures the opacity or density of exhaust gases providing an indication of engine combustion efficiency and emissions.
- _____ interface with the engine's electronic control systems and can help pinpoint specific faults and guide troubleshooting efforts.
- A(n) _____ measures electrical parameters and diagnoses electrical faults.

2. Complete the following sentences on key considerations related to insulation in marine refrigeration systems with the appropriate form of the words in parentheses. (16 p.)

- Insulate refrigerated spaces like cold rooms and _____ (**contain**).
- Ensure the correct insulation _____ (**thick**) to reduce heat transfer.
- Properly install and maintain insulation, since gaps or damage can compromise _____ (**effective**), leading to energy _____ (**lose**).
- Insulate _____ (**refrigerate**) lines and piping to reduce energy _____ (**consume**).
- Choose the right insulation material based on thermal _____ (**conduct**), moisture _____ (**resist**), durability and cost.
- Effective insulation reduces the workload on refrigeration equipment. Well-_____ (**insulate**) spaces require less cooling capacity and operate more _____ (**efficient**).
- Insulate refrigeration _____ (**machine**) components like evaporators, condensers and compressors to minimise heat transfer and prevent _____ (**condense**) or frosting.
- Selecting insulation materials that withstand marine _____ (**environment**) conditions, such as temperature extremes, _____ (**humid**), and _____ (**expose**) to moisture or chemicals can ensure long-term thermal _____ (**perform**).

3. Fill in the gaps with a word from the list. There are two (2) extra words. (16 p.)

sweep	cold	micro-seizure	corrosive	firing
film	stripping	wearing	quills	exhaust
puncture	loads	friction	scuffing	run
leafing	abrasive	welding		

- _____ often occurs during a running-in period and may not be destructive.
- There are two different _____ mechanisms in the engine that result in the iron content of cylinder oil: a) _____ iron due to acids present, b) _____ iron resulting from the worn cylinder liner surface.
- Clover _____ takes place between each pair of lubricating _____ due to the sulphur contained in heavy fuel oil.
- _____ testing is extremely important for an operator to fully understand cylinder lubricant demands.
- _____ occurs when there is a breakdown of cylinder oil _____, and results in localised _____ between points on the piston rings and the liner surface.
- What is the backpressure for _____?
- If one or more cylinders are not _____, you should check the suction valve and the _____ valve in the fuel pump.
- _____ corrosion is at its most serious in the latest generation of low-speed engines which _____ at part or very low _____.

4. Complete the following sentences with an appropriate word. The first letter is given. (18 p.)

- Although permanent insulation is ideal for long **p** _____ runs, it is difficult to be removed for maintenance or inspection by the crew.
- **C** _____ fines originating from the refining process, are in fact one of the most common causes of abrasive wear.

- If the **s** _____ air valves in the cylinder covers are defective, you should **p** _____-test them for leakages.
- The residual **B** _____ Number shows the amount of remaining alkalinity in the cylinder oil.
- You should treat oil **s** _____ with dispersants.
- Insulation **b** _____ can be installed and removed by the ship's crew.
- On oil **t** _____, a fixed piping arrangement is used to blow **i** _____ gas into each cargo tank in order to reduce the risk of fires or explosions.
- If the engine turns on fuel, but runs unevenly and does not pick up rpm, the auxiliary **b** _____ may not function properly.
- The initials COW stand for **C** _____ Oil Washing.
- The **b** _____ of a cylinder describes the inside diameter of the cylinder.

5. Match the words from the list to their synonyms/definitions below. There is one (1) extra word. (14 p.)

compromise	outlawing	calibrate	fluctuation
defective	remedy	special orders	cladding
troubleshoot	scoring	pitting	alloy
standing orders	dilute	gauge	

- small, localised marks or holes on a surface _____
- variation or change over time _____
- deep scratches or grooves on a surface _____
- making something illegal or unacceptable _____
- orders given by the C/E that must always be followed _____
- faulty _____
- make a liquid thinner by adding water or other solvent _____
- put at risk _____
- measure _____
- mixture of metals _____
- adjust or mark a measuring instrument to ensure accuracy against a standard value _____
- a covering of hard material used as protection _____
- trace and correct faults in a mechanical system _____
- a way of solving or correcting a problem _____

6. Complete the following orders using the verbs in the list. (8 p.)

fit	plug	pump out	stand by
dispose of	stop	close	start

- _____ the scuppers and report.
- _____ the sea valves and report.
- _____ bonding wire and report.
- _____ oil clearance team and report.
- _____ pumping slowly and report.
- _____ ballast tank No2 and report.
- _____ the sludge into the sludge tank and report.
- _____ the ballast overflow pump and report.

7. Choose the correct answer. (10 p.)

- The ... cools down the air in the cargo hold or room by transferring latent heat to the refrigerant.
a. evaporator b. compressor c. cooler d. receiver
- The ... is used to liquify the refrigerant and to subcool it below the saturation temperature by circulating sea water, fresh water or air.
a. condenser b. evaporator c. compressor d. cooler
- Combustion knock can occur in the cylinders of a diesel engine under any conditions permitting:
a. a shortened ignition delay period c. rapid vaporisation of injected fuel droplets
b. a lean fuel/air mixture d. excess fuel in the combustion chamber
- Different ... valves in a refrigeration system provide automatic opening and closing of the liquid lines.
a. expansion b. relief c. solenoid d. safety
- Diesel engine lube oil diluted with diesel fuel oil is indicated by:
a. increased viscosity c. decreased pour point
b. increased flash point d. decreased viscosity
- Heavy residual fuel oils are heated prior to centrifuging to:
a. reduce fuel viscosity c. separate fuel from lube oil
b. reduce fuel weight d. increase specific gravity
- “Loop”, “uniflow”, “cross flow” are terms used to describe various types of:
a. scavenging b. turbochargers c. control air circuits d. supercharging
- A disadvantage of 4-stroke cycle over a 2-stroke cycle is:
a. intake valves temperatures higher than exhaust valves temperatures
b. greater weight per horsepower ratio
c. the required use of scavenge ports
d. higher working temperature of pistons and cylinders
- Which of the following will have a direct impact on the wear rate of a cylinder liner?
a. temperature of the scavenging air c. compression ratio of the piston
b. quality of fuel injected d. amount of scavenge air in the cylinder
- A diesel engine is supercharged in order to:
a. lower the no-load rpm c. increase the no-load rpm
b. provide more fuel for combining with air d. provide more air for combining with fuel
- The ... unit consists of different safety and operating circuits for the safe operation of the refrigeration plant.
a. check b. command c. regulation d. control
- A decrease in the flash point of the diesel engine lube oil indicates that the lube oil is:
a. contaminated with carbon c. diluted with water
b. diluted with fuel oil d. contaminated with sludge
- The ... valve is controlled by a thermostat to regulate the flow of the refrigerant from the H.P. side of the system to the L.P. side.
a. relief b. throttle c. solenoid d. expansion
- A piston is said to be at bottom dead centre when it is:
a. closing the fuel ports c. nearest to the cylinder head
b. farthest from the cylinder head d. opening the exhaust ports
- Which of the following substances can be satisfactorily removed from diesel oil by centrifuging?
a. gasoline b. fuel oil c. lube oil d. sludge
- The ... promotes circulation of the refrigerant by pumping it around the system.
a. evaporator b. compressor c. solenoid valve d. pump

- In a diesel engine, pistons are attached to the crankshaft by:
 - a. connecting rods b. push rods c. lash adjusters d. piston guides
- The ... consists of silica gel to remove any moisture from the refrigerant.
 - a. evaporator b. condenser c. separator d. drier
- The ... serves to collect the cooled refrigerant, and is also used to drain out the refrigerant from the system for maintenance purposes.
 - a. receiver b. drain tank c. sump tank d. refrigerant tank
- A scored cylinder liner will cause:
 - a. rapid wearing of piston rings c. combustion gases in the cooling water
 - b. high firing pressure d. abnormally high cooling water temperature

8. State whether the following sentences are True (T) or False (F). (6 p.)

- A disadvantage of a 2-stroke diesel engine is the complicated valve gear.
- Rapid increase in pressure and temperature occurs in the combustion chamber of a diesel engine cylinder shortly after ignition and before the piston reaches T.D.C.
- Abrasive particles (in the fuel or in the air) cause corrosion.
- Before starting any testing or fault-finding procedure, the engineers should thoroughly review the manuals provided by the manufacturers.
- Fiberglass, mineral wool, Calcium Silicate and ceramic insulation are non-combustible materials.
- Handing over the watch on a ship requires clear communication between the handing over and relieving engineers.
- A centrifugal separator can satisfactorily remove sulphur compounds from fuel oil.
- The relieving engineers should not be informed of any special orders regarding ship operation, systems, or maintenance.
- Excessive cylinder liner wear can cause increased blow-by.
- Temperatures below the dew point allow steam to condense.
- Improper refrigeration can lead to oxidation of temperature sensitive cargo.
- The evaporator cools the refrigerant back to a gas at a very low temperature.

